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CLAIMS

1. In a reactor for processing a semiconductor wafer, having a vessel, a cup within the vessel for holding a level of process fluid, an anode arranged at a position within the cup, and a wafer support for holding a wafer at a second position spaced from the anode, the improvement comprising:
- 5 a diffusion plate member arranged between the anode and the wafer, said diffusion plate member having a plurality of openings therethrough, said openings arranged in a spiral pattern, said wafer support and said diffusion plate member arranged to be rotated relative to each other.
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2. The improvement according to claim 1, wherein said openings in said diffusion plate member comprise a plurality of slots that are elongated and curved along a spiral path.
3. The improvement according to claim 1, comprising a support structure held at an elevation within said vessel, wherein said support structure includes plural alternate mounting locations for said diffusion plate member at different vertical positions with respect to said cup.
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4. The improvement according to claim 3 wherein said support structure comprises a mounting ring having a plurality of annular grooves on an

inside surface of said mounting ring at incremental elevations for
engaging an edge of said diffusion plate member.

- 5 5. The improvement according to claim 4, wherein said diffusion plate
member has rounded edges to enhance snap-fitting of said diffusion plate into a selected
one of said annular grooves.
6. The improvement according to claim 4, wherein said support structure
includes an annular shield overlying said mounting ring and having a
central opening smaller than said inside surface of said mounting ring.
- 10 7. The improvement according to claim 6, wherein said annular shield
includes plural tool engageable recesses for receiving a hook member of
a tool from above.
- 15 8. The improvement according to claim 4, wherein said reactor includes an
anode shield mounted below said anode, and said shield includes a
plurality of brackets extending upwardly to an elevation above said
anode and said mounting ring and said brackets are configured to
provide bayonet connections therebetween.
- 20 9. A reactor for electroplating a wafer, comprising:
a vessel;
a rotor having wafer holding structure for holding a wafer within said
vessel and a rotary device for spinning the wafer;

a cup for holding a supply of process fluid, said cup held within said vessel;

an anode located within said cup and having a top surface and a bottom surface;

5 a conductor electrically connected to said anode;

said conductor extending downwardly through said vessel and exposed outside of said housing for electrical connection thereto; and

a diffusion plate member located between said anode and said wafer holding structure, said diffusion plate member having a plurality of holes arranged in a spiral pattern.

10 10. The reactor according to claim 9, wherein said openings in said diffusion plate comprise a plurality of slots that are elongated and curved along a spiral path.

11. The reactor according to claim 9, comprising a diffuser support structure held at an elevation within said vessel, wherein said diffuser support structure includes plural alternate mounting locations for said diffusion plate member at different vertical positions with respect to said cup.

12. The reactor according to claim 11 wherein said diffuser support structure comprises a mounting ring having a plurality of annular grooves on an

inside surface of said mounting ring at incremental elevations for
engaging an edge of said diffusion plate member.

- 5 13. The reactor according to claim 12, wherein said diffusion plate member
has rounded edges to enhance snap-fitting of said diffusion plate into a selected one of
said annular grooves.

- 10 14. The reactor according to claim 11, wherein said diffuser support
structure includes an annular shield overlying said mounting ring and
having a central opening smaller than said inside surface of said mounting
ring.

- 15 15. The reactor according to claim 14, wherein said annular shield includes
plural tool engageable recesses for receiving a hook member of a tool
from above.

- 15 16. The reactor according to claim 9, wherein said reactor includes an anode
shield mounted below said anode, and said shield includes a plurality of
brackets extending upwardly to an elevation above said anode and said
mounting ring and said brackets are configured to provide bayonet
connections therebetween.